FIG. 1

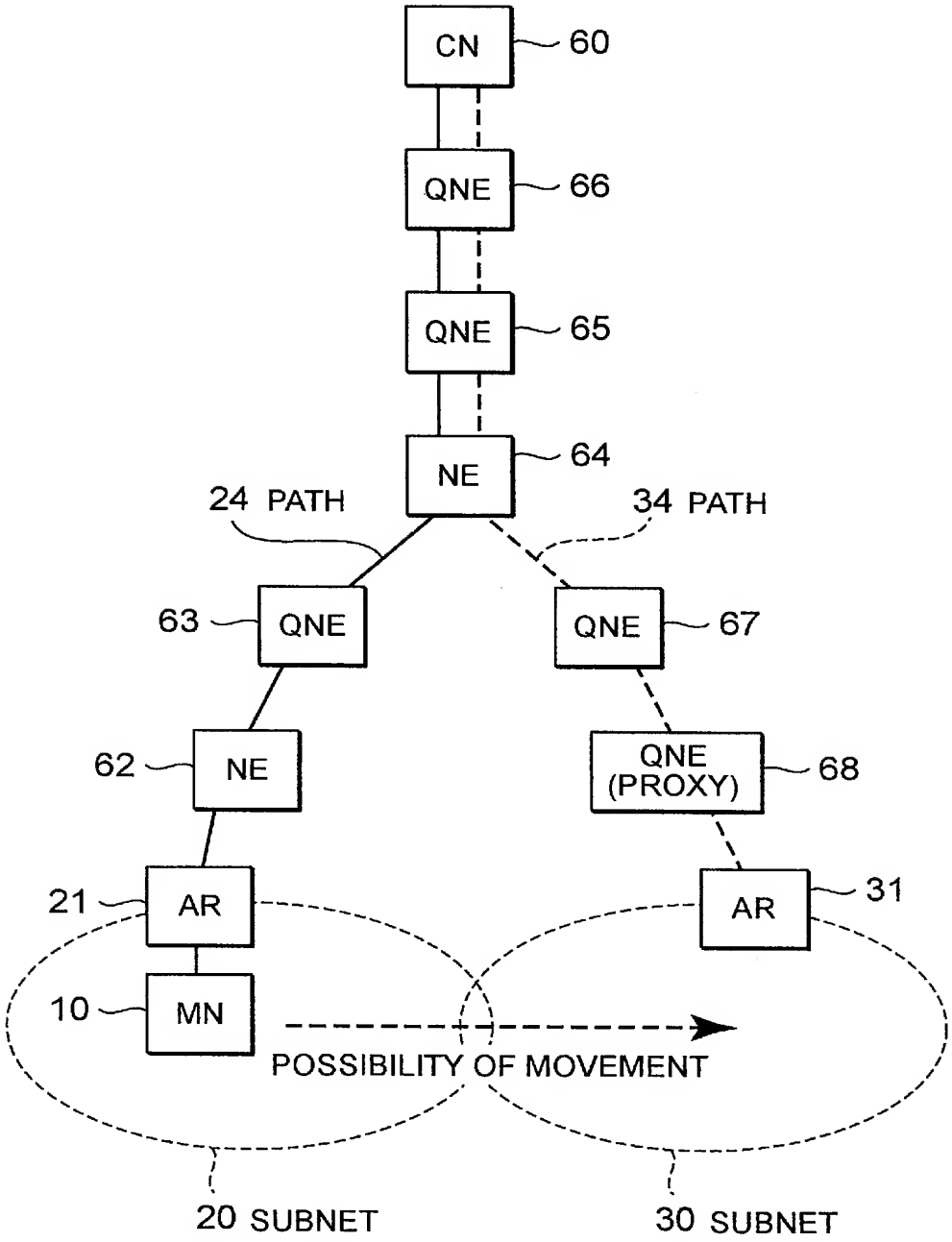

CN
60
QNE
66
QNE
65
NE
64
24 PATH
34 PATH
63
QNE
QNE
67
62
NE
QNE
(PROXY)
68
21
AR
AR
31
10
MN
POSSIBILITY OF MOVEMENT
20 SUBNET
30 SUBNET

FIG. 2

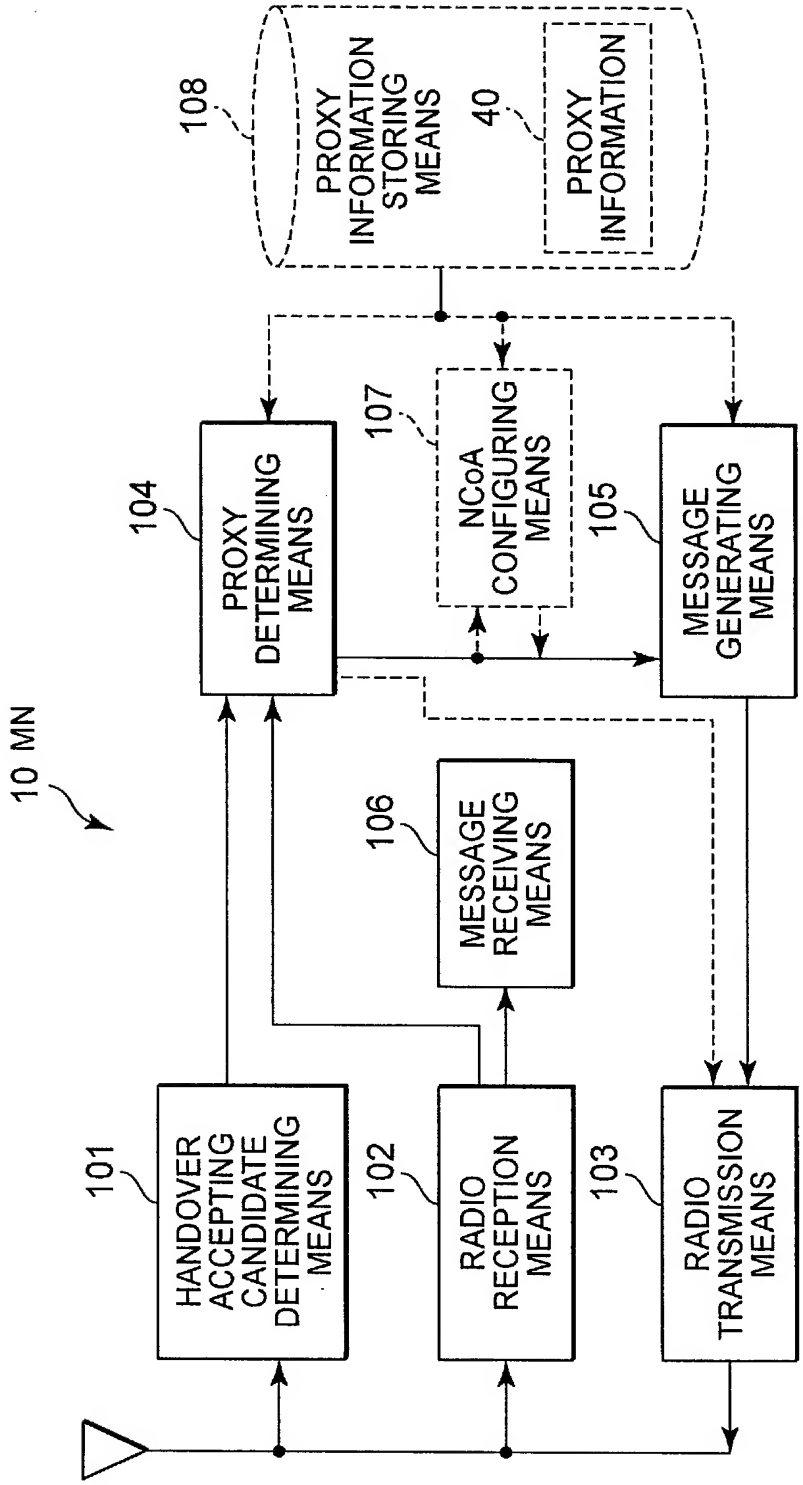

10 MN
101
HANDOVER ACCEPTING CANDIDATE DETERMINING MEANS
102
RADIO RECEPTION MEANS
103
RADIO TRANSMISSION MEANS
104
PROXY DETERMINING MEANS
105
MESSAGE GENERATING MEANS
106
MESSAGE RECEIVING MEANS
107
NCoA CONFIGURING MEANS
108
PROXY INFORMATION STORING MEANS
40
PROXY INFORMATION

FIG. 3

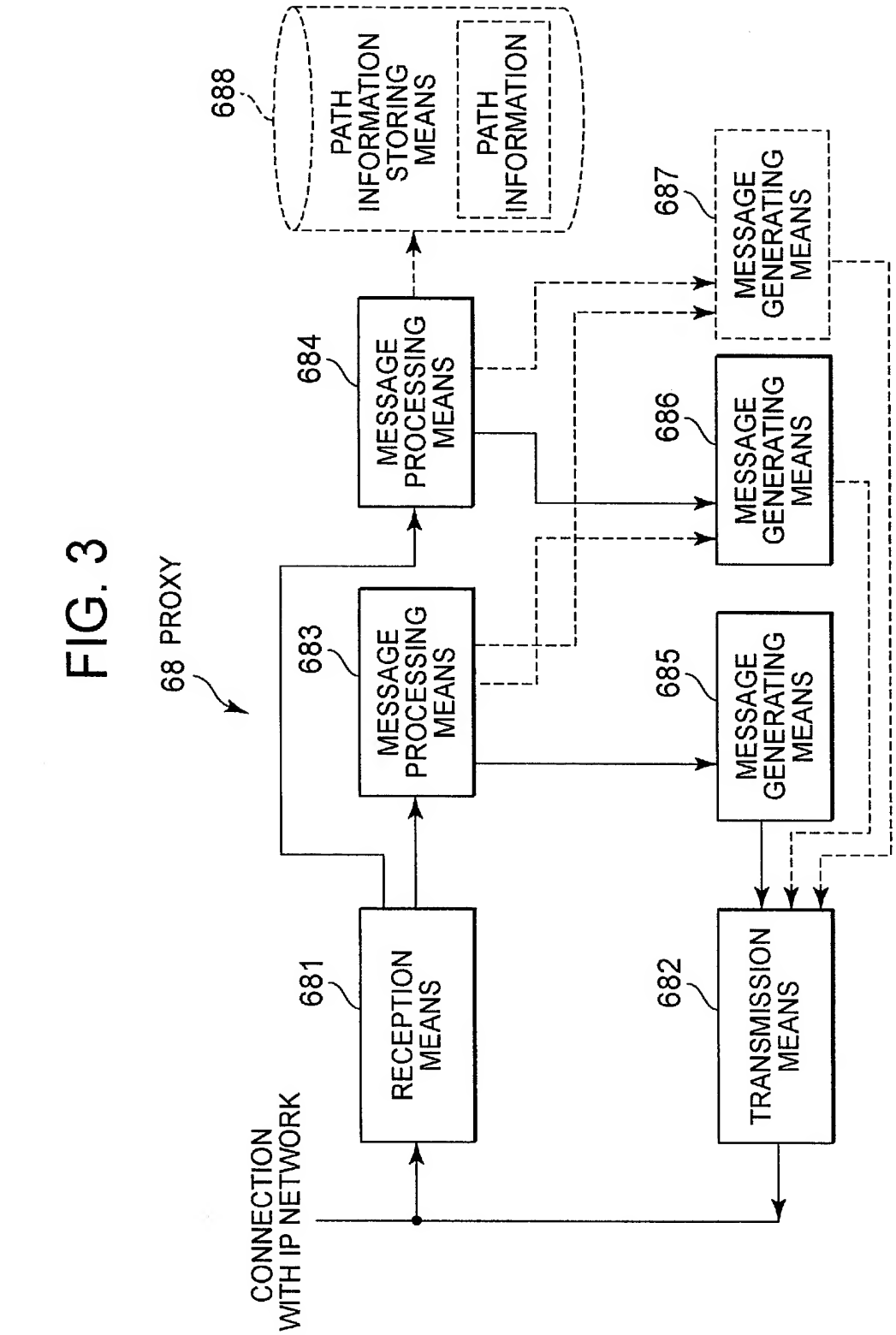

68 PROXY
CONNECTION WITH IP NETWORK
681
RECEPTION MEANS
682
TRANSMISSION MEANS
683
MESSAGE PROCESSING MEANS
684
MESSAGE PROCESSING MEANS
685
MESSAGE GENERATING MEANS
686
MESSAGE GENERATING MEANS
687
MESSAGE GENERATING MEANS
688
PATH INFORMATION STORING MEANS
PATH INFORMATION

FIG. 4

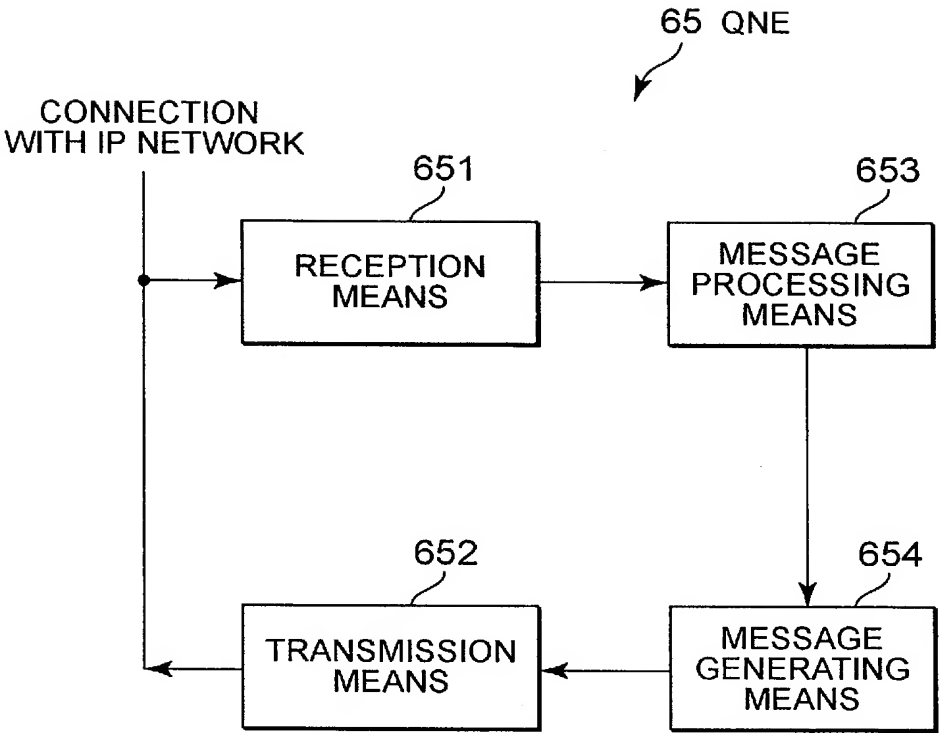

65 QNE
CONNECTION WITH IP NETWORK
651
RECEPTION MEANS
653
MESSAGE PROCESSING MEANS
652
TRANSMISSION MEANS
654
MESSAGE GENERATING MEANS

FIG. 5

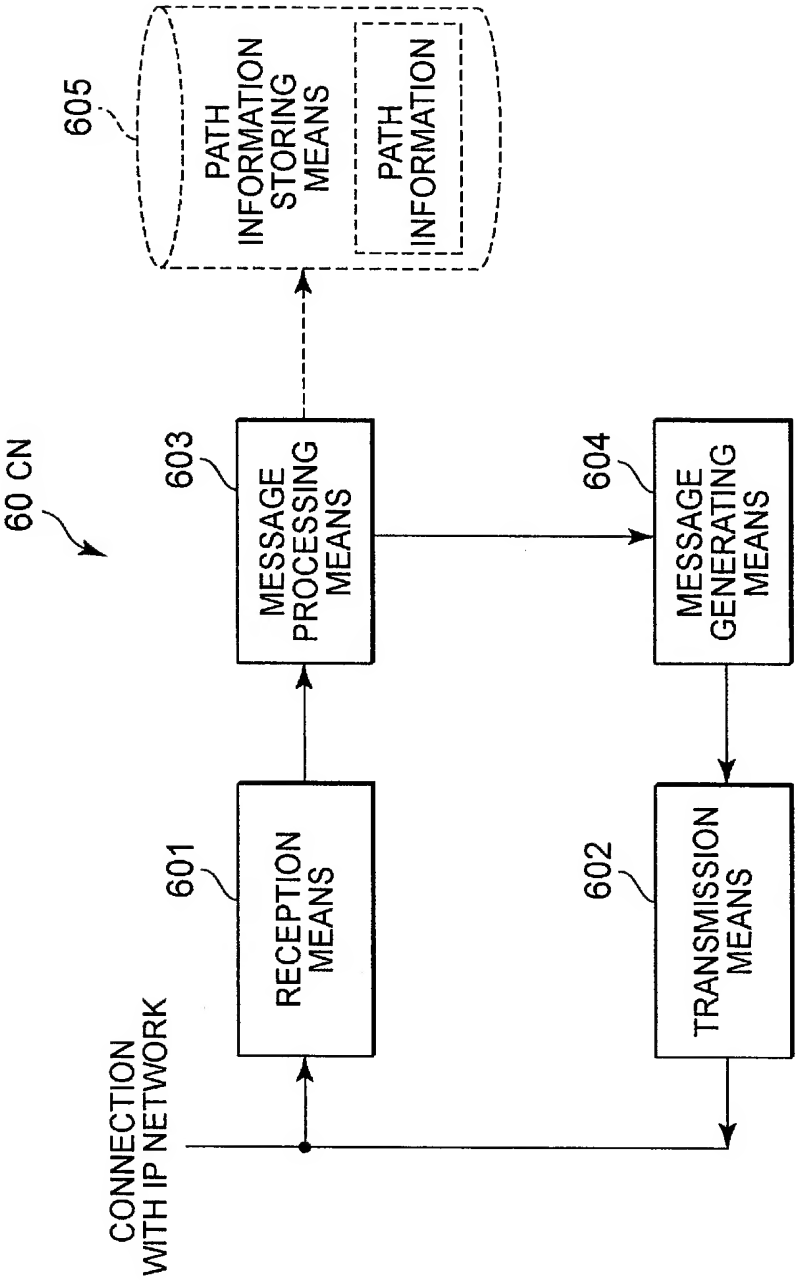

60 CN
605
PATH INFORMATION STORING MEANS
PATH INFORMATION
603
MESSAGE PROCESSING MEANS
604
MESSAGE GENERATING MEANS
601
RECEPTION MEANS
602
TRANSMISSION MEANS
CONNECTION WITH IP NETWORK

FIG. 6

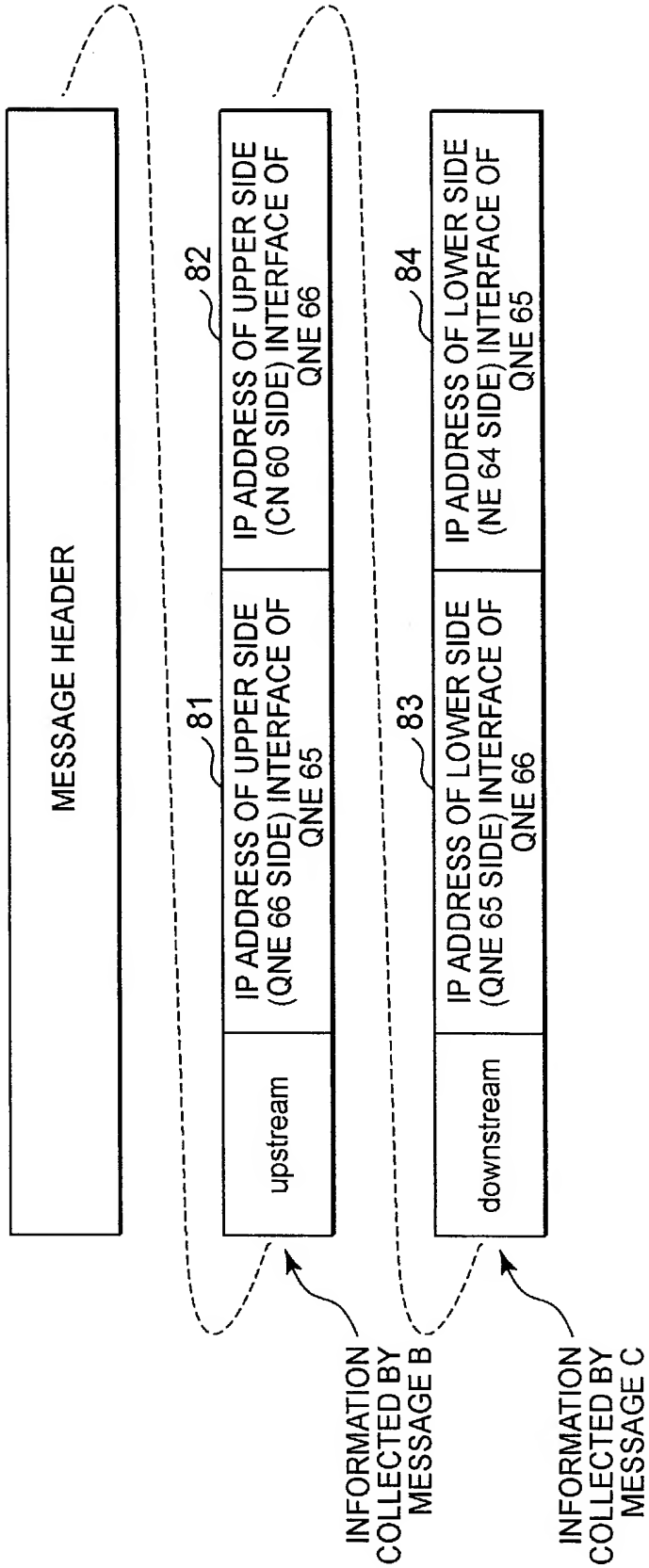

MESSAGE HEADER
81
IP ADDRESS OF UPPER SIDE (QNE 66 SIDE) INTERFACE OF QNE 65
82
IP ADDRESS OF UPPER SIDE (CN 60 SIDE) INTERFACE OF QNE 66
upstream
83
IP ADDRESS OF LOWER SIDE (QNE 65 SIDE) INTERFACE OF QNE 66
84
IP ADDRESS OF LOWER SIDE (NE 64 SIDE) INTERFACE OF QNE 65
downstream
INFORMATION COLLECTED BY MESSAGE B
INFORMATION COLLECTED BY MESSAGE C

FIG. 7

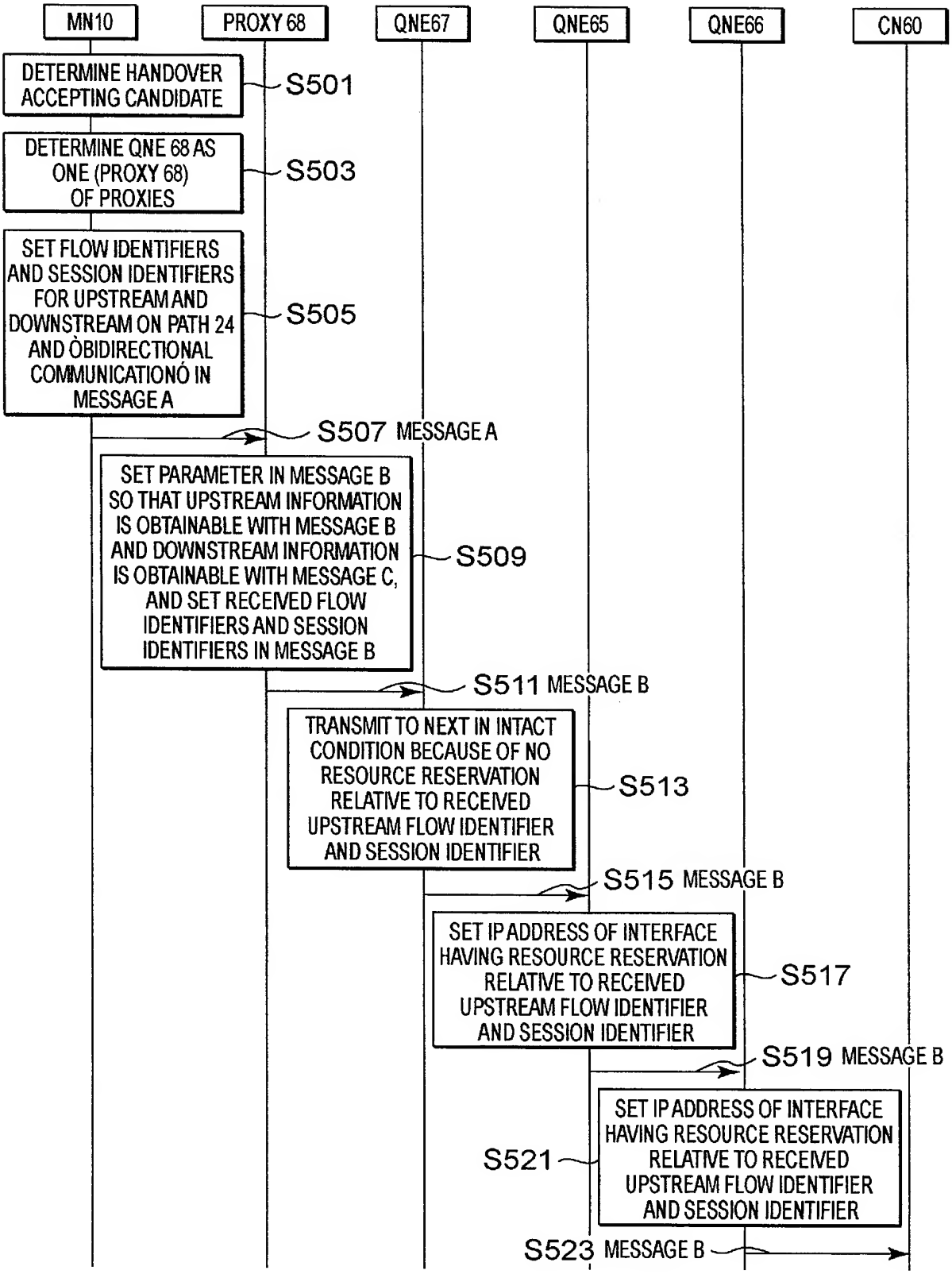

MN10
PROXY 68
QNE67
QNE65
QNE66
CN60
DETERMINE HANDOVER ACCEPTING CANDIDATE
S501
DETERMINE QNE 68 AS ONE (PROXY 68) OF PROXIES
S503
SET FLOW IDENTIFIERS AND SESSION IDENTIFIERS FOR UPSTREAM AND DOWNSTREAM ON PATH 24 AND ÒBIDIRECTIONAL COMMUNICATIONÓ IN MESSAGE A
S505
S507 MESSAGE A
SET PARAMETER IN MESSAGE B SO THAT UPSTREAM INFORMATION IS OBTAINABLE WITH MESSAGE B AND DOWNSTREAM INFORMATION IS OBTAINABLE WITH MESSAGE C, AND SET RECEIVED FLOW IDENTIFIERS AND SESSION IDENTIFIERS IN MESSAGE B
S509
S511 MESSAGE B
TRANSMIT TO NEXT IN INTACT CONDITION BECAUSE OF NO RESOURCE RESERVATION RELATIVE TO RECEIVED UPSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S513
S515 MESSAGE B
SET IP ADDRESS OF INTERFACE HAVING RESOURCE RESERVATION RELATIVE TO RECEIVED UPSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S517
S519 MESSAGE B
SET IP ADDRESS OF INTERFACE HAVING RESOURCE RESERVATION RELATIVE TO RECEIVED UPSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S521
S523 MESSAGE B

FIG. 8

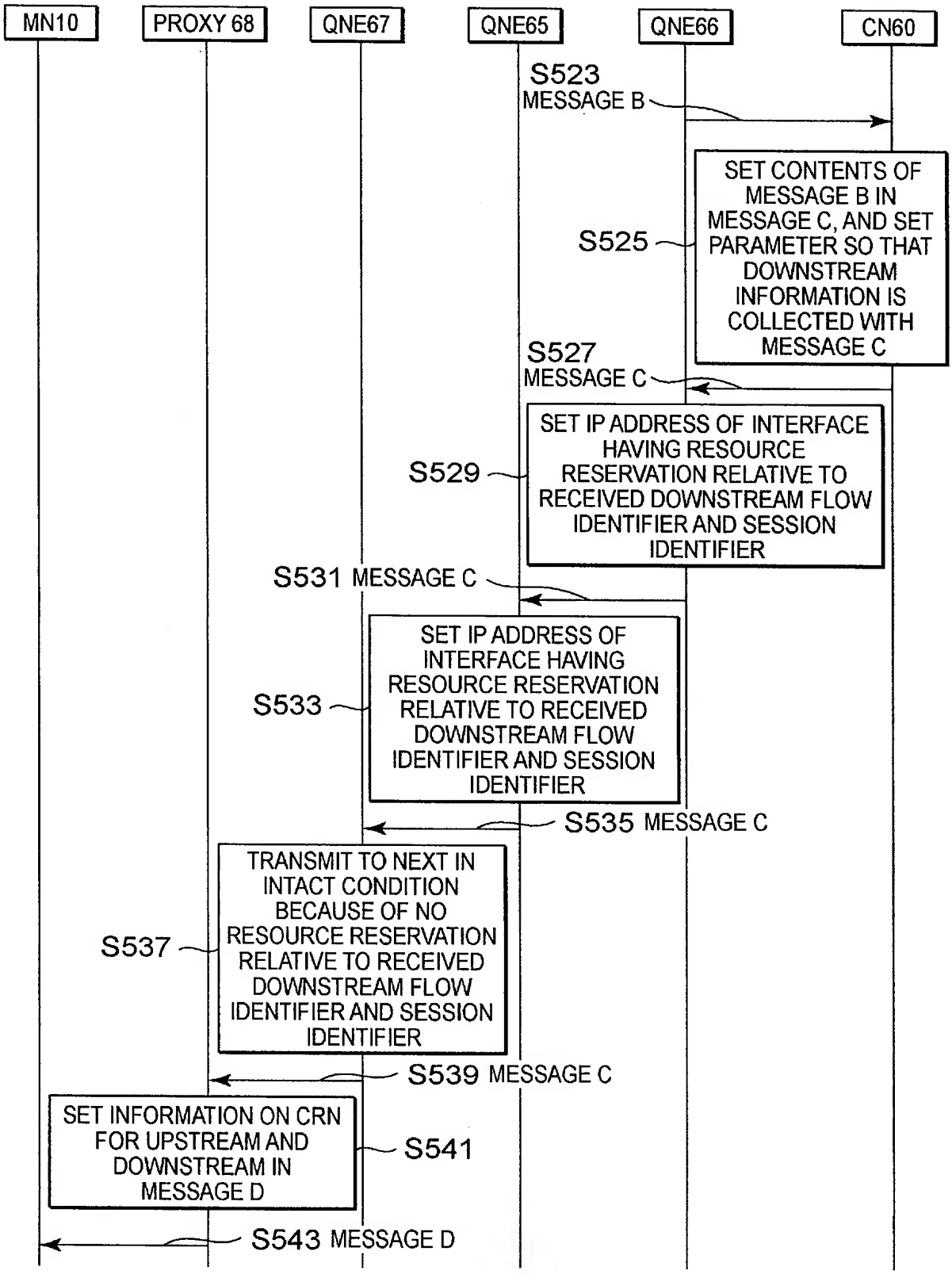

MN10
PROXY 68
QNE67
QNE65
QNE66
CN60
S523
MESSAGE B
SET CONTENTS OF MESSAGE B IN MESSAGE C, AND SET PARAMETER SO THAT DOWNSTREAM INFORMATION IS COLLECTED WITH MESSAGE C
S525
S527
MESSAGE C
SET IP ADDRESS OF INTERFACE HAVING RESOURCE RESERVATION RELATIVE TO RECEIVED DOWNSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S529
S531 MESSAGE C
SET IP ADDRESS OF INTERFACE HAVING RESOURCE RESERVATION RELATIVE TO RECEIVED DOWNSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S533
S535 MESSAGE C
TRANSMIT TO NEXT IN INTACT CONDITION BECAUSE OF NO RESOURCE RESERVATION RELATIVE TO RECEIVED DOWNSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S537
S539 MESSAGE C
SET INFORMATION ON CRN FOR UPSTREAM AND DOWNSTREAM IN MESSAGE D
S541
S543 MESSAGE D

FIG. 9

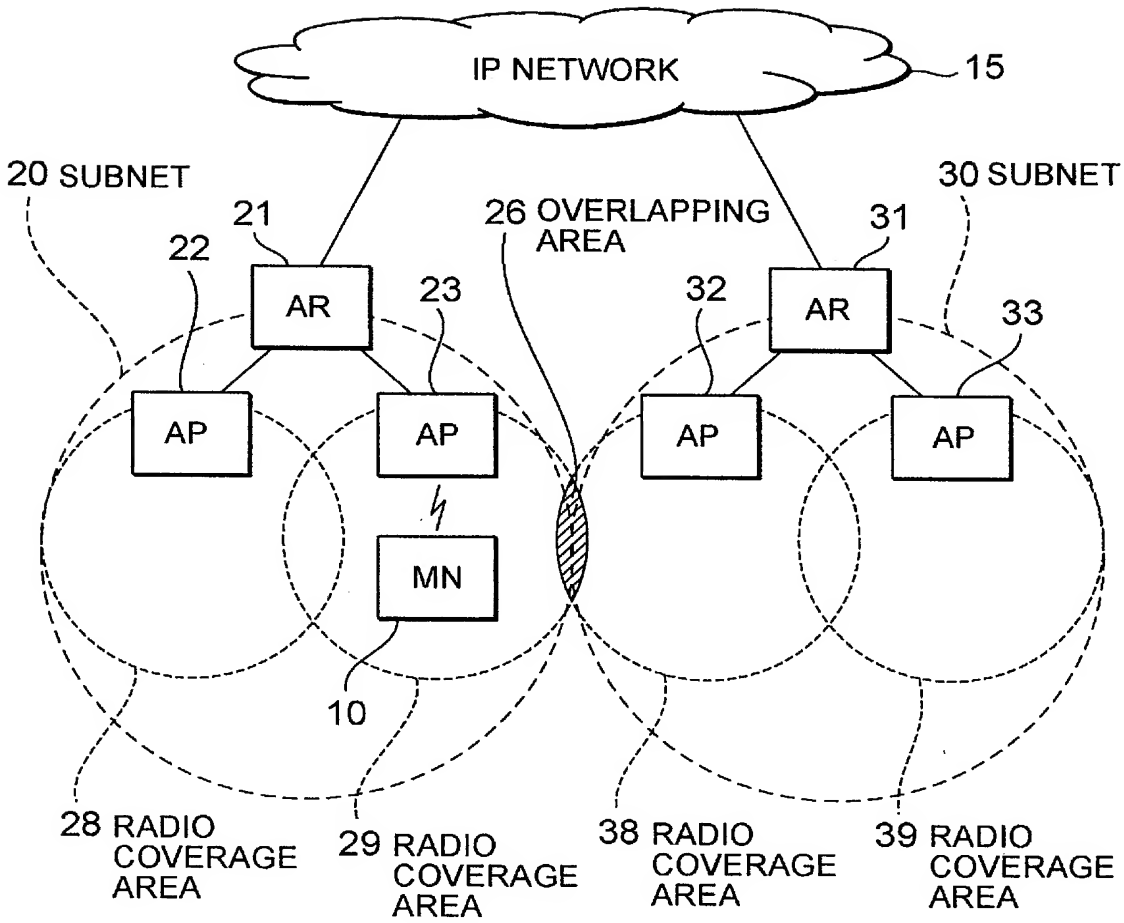

IP NETWORK
15
20 SUBNET
30 SUBNET
21
22
23
26 OVERLAPPING AREA
31
32
33
AR
AR
AP
AP
AP
AP
MN
10
28 RADIO COVERAGE AREA
29 RADIO COVERAGE AREA
38 RADIO COVERAGE AREA
39 RADIO COVERAGE AREA

FIG. 10
PRIOR ART

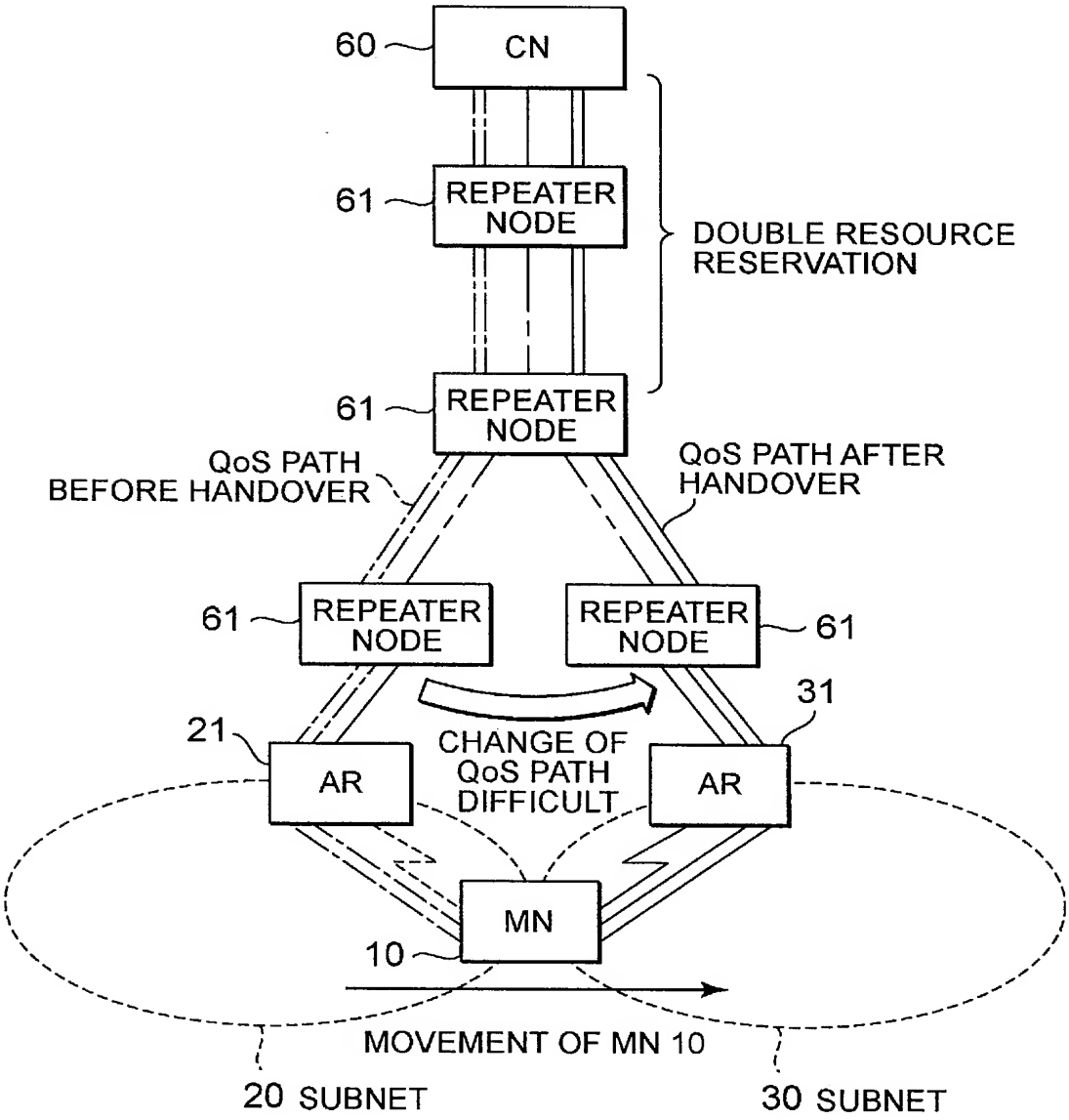


FIG. 11
PRIOR ART

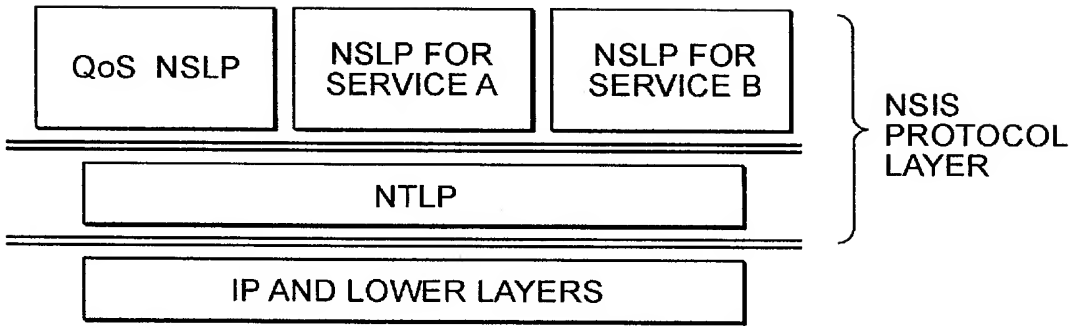


FIG. 12
PRIOR ART

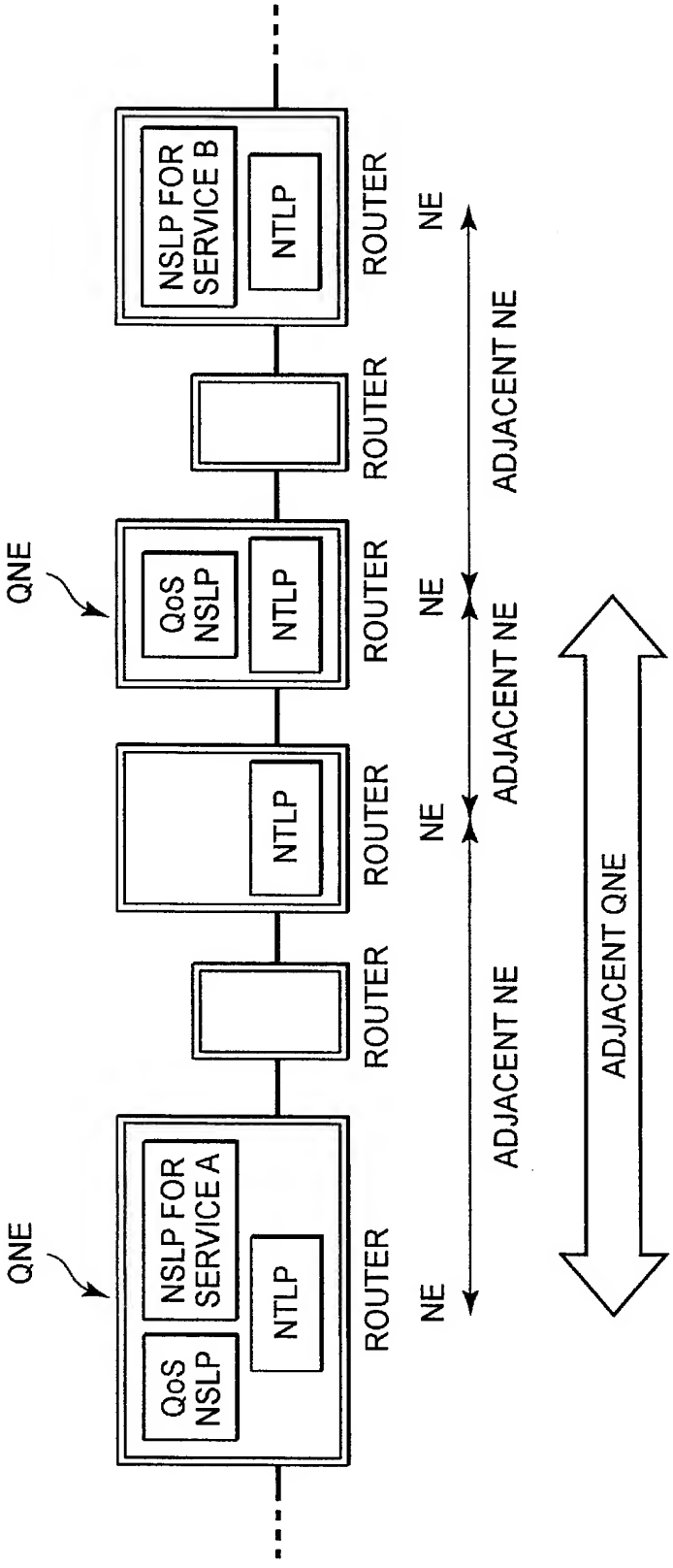


FIG. 13
PRIOR ART

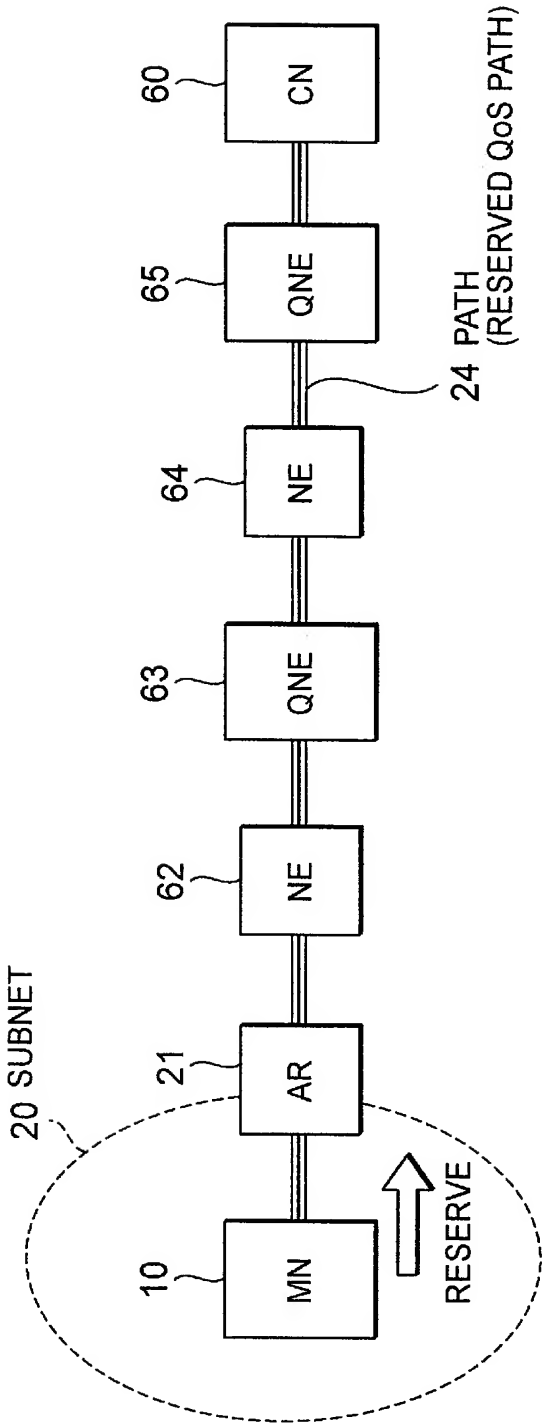


FIG. 14
PRIOR ART

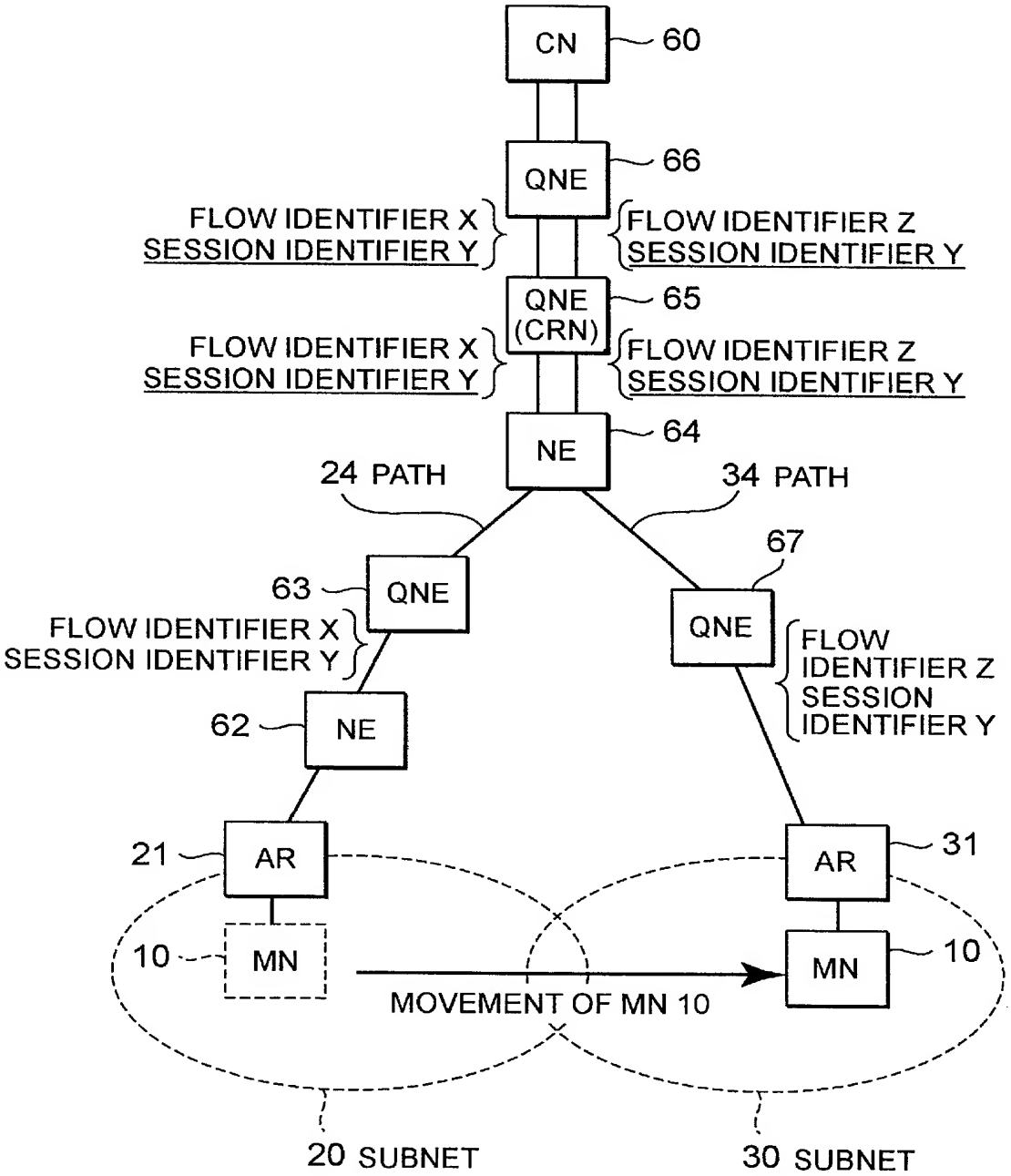


FIG. 15

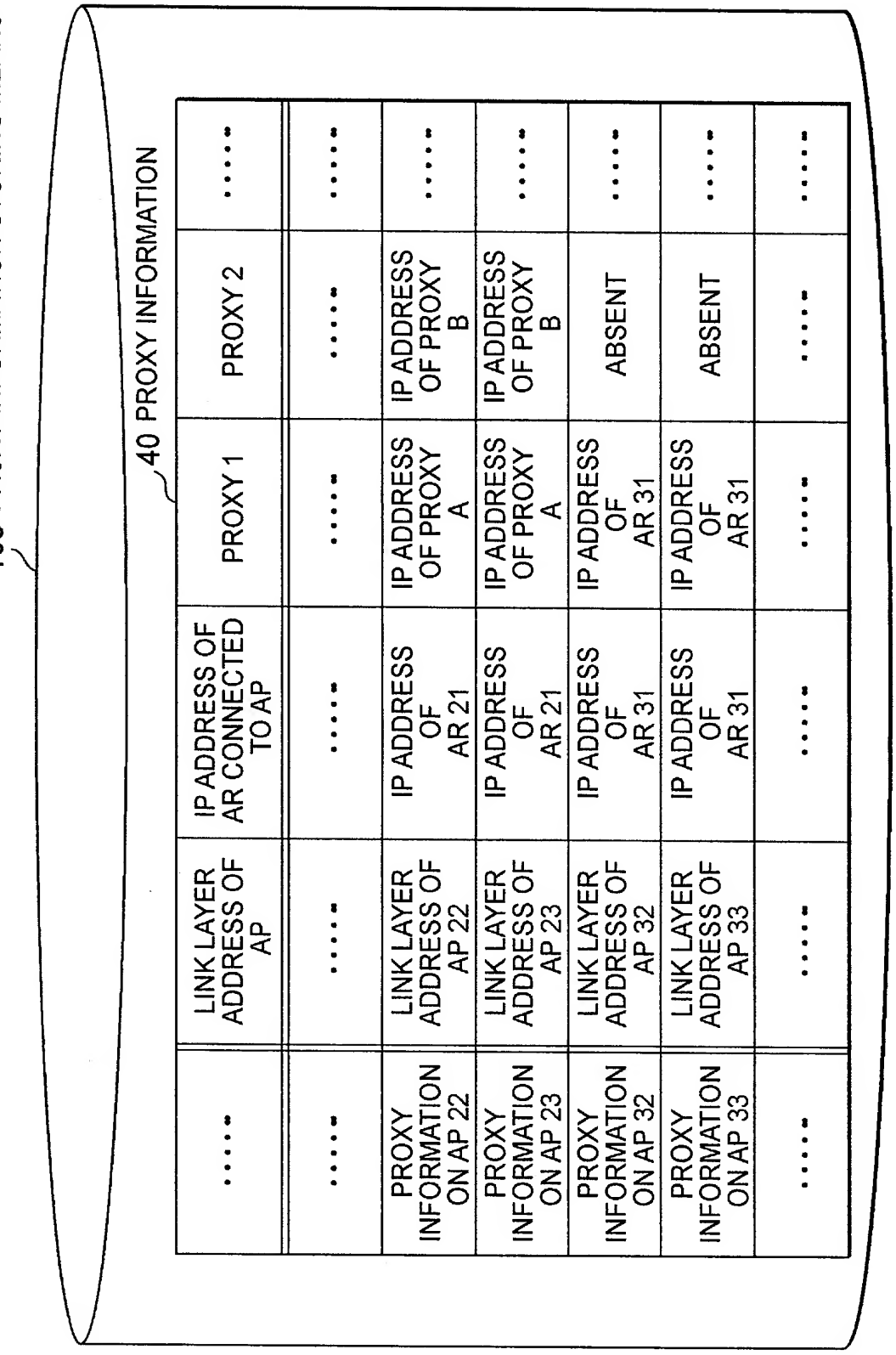

108 PROXY INFORMATION STORING MEANS
40 PROXY INFORMATION
LINK LAYER ADDRESS OF AP
IP ADDRESS OF AR CONNECTED TO AP
PROXY 1
PROXY 2
PROXY INFORMATION ON AP 22
LINK LAYER ADDRESS OF AP 22
IP ADDRESS OF AR 21
IP ADDRESS OF PROXY A
IP ADDRESS OF PROXY B
PROXY INFORMATION ON AP 23
LINK LAYER ADDRESS OF AP 23
IP ADDRESS OF AR 21
IP ADDRESS OF PROXY A
IP ADDRESS OF PROXY B
PROXY INFORMATION ON AP 32
LINK LAYER ADDRESS OF AP 32
IP ADDRESS OF AR 31
IP ADDRESS OF AR 31
ABSENT
PROXY INFORMATION ON AP 33
LINK LAYER ADDRESS OF AP 33
IP ADDRESS OF AR 31
IP ADDRESS OF AR 31
ABSENT

FIG. 16

41 AP-AR CORRESPONDENCE INFORMATION

.....	.....	.....	.....	.....
CORRESPONDENCE INFORMATION ON AP 22-AR 21	LINK LAYER ADDRESS OF AP 22	LINK LAYER ADDRESS OF AR 21	NETWORK PREFIX OF SUBNET 20	PREFIX LENGTH OF SUBNET 20
CORRESPONDENCE INFORMATION ON AP 23-AR 21	LINK LAYER ADDRESS OF AP 23	LINK LAYER ADDRESS OF AR 21	NETWORK PREFIX OF SUBNET 20	PREFIX LENGTH OF SUBNET 20
CORRESPONDENCE INFORMATION ON AP 32-AR 31	LINK LAYER ADDRESS OF AP 32	LINK LAYER ADDRESS OF AR 31	NETWORK PREFIX OF SUBNET 30	PREFIX LENGTH OF SUBNET 30
CORRESPONDENCE INFORMATION ON AP 33-AR 31	LINK LAYER ADDRESS OF AP 33	LINK LAYER ADDRESS OF AR 31	NETWORK PREFIX OF SUBNET 30	PREFIX LENGTH OF SUBNET 30
.....	.....	.....	.....	.....

FIG. 17

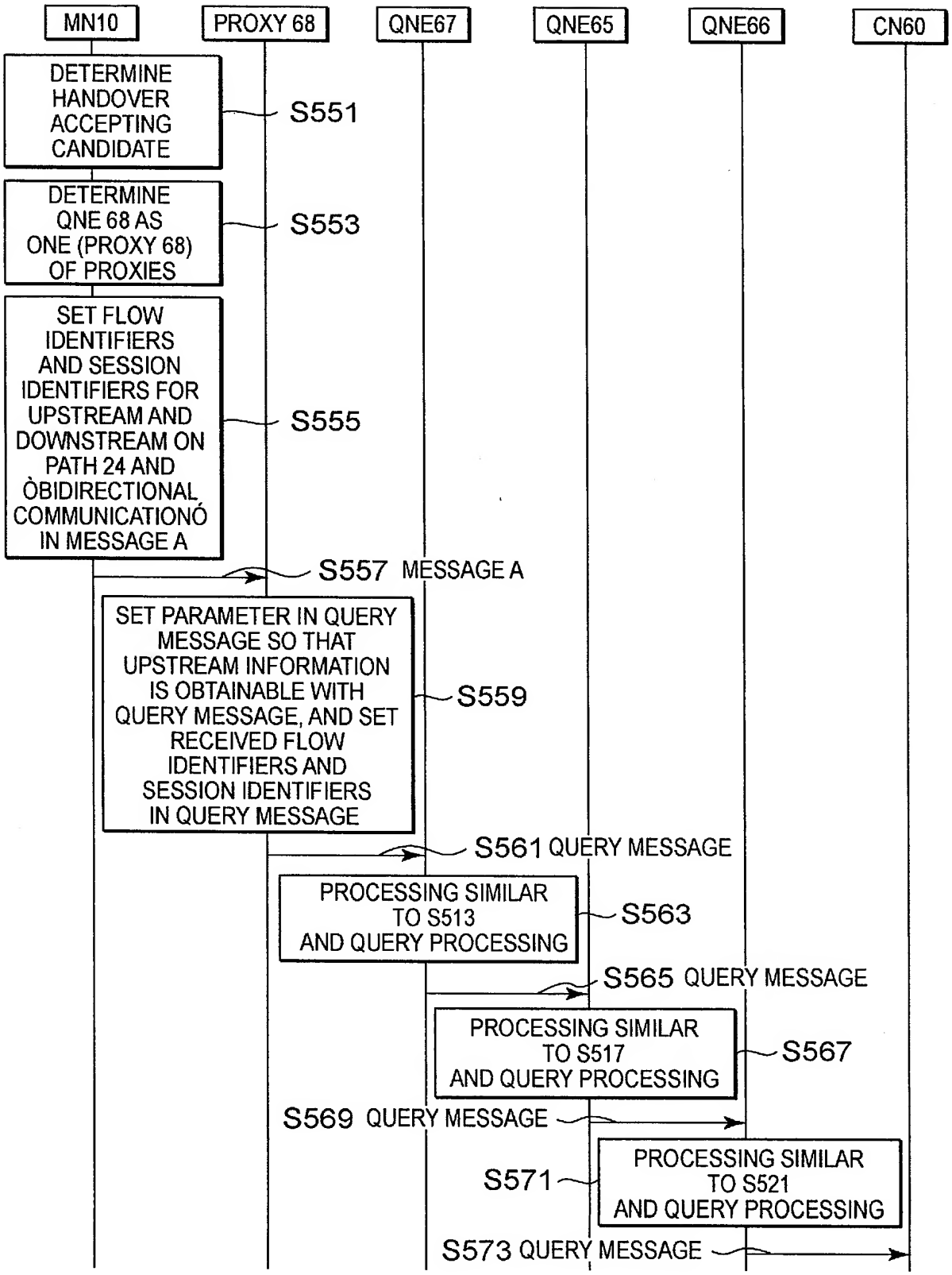

MN10
PROXY 68
QNE67
QNE65
QNE66
CN60
DETERMINE HANDOVER ACCEPTING CANDIDATE
S551
DETERMINE QNE 68 AS ONE (PROXY 68) OF PROXIES
S553
SET FLOW IDENTIFIERS AND SESSION IDENTIFIERS FOR UPSTREAM AND DOWNSTREAM ON PATH 24 AND ÒBIDIRECTIONAL COMMUNICATIONÓ IN MESSAGE A
S555
S557 MESSAGE A
SET PARAMETER IN QUERY MESSAGE SO THAT UPSTREAM INFORMATION IS OBTAINABLE WITH QUERY MESSAGE, AND SET RECEIVED FLOW IDENTIFIERS AND SESSION IDENTIFIERS IN QUERY MESSAGE
S559
S561 QUERY MESSAGE
PROCESSING SIMILAR TO S513 AND QUERY PROCESSING
S563
S565 QUERY MESSAGE
PROCESSING SIMILAR TO S517 AND QUERY PROCESSING
S567
S569 QUERY MESSAGE
S571
PROCESSING SIMILAR TO S521 AND QUERY PROCESSING
S573 QUERY MESSAGE

FIG. 18

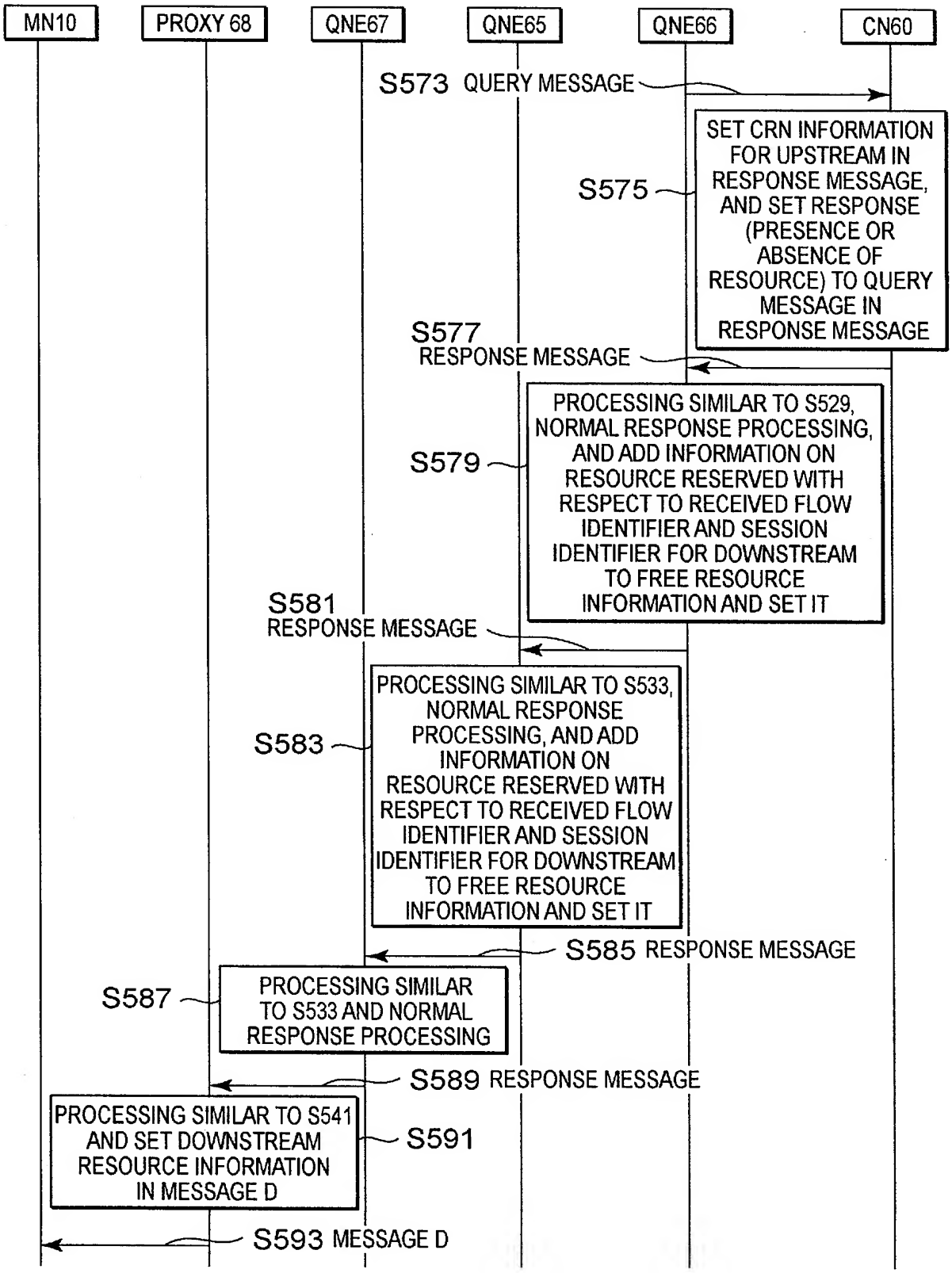

MN10
PROXY 68
QNE67
QNE65
QNE66
CN60
S573 QUERY MESSAGE
SET CRN INFORMATION FOR UPSTREAM IN RESPONSE MESSAGE, AND SET RESPONSE (PRESENCE OR ABSENCE OF RESOURCE) TO QUERY MESSAGE IN RESPONSE MESSAGE
S575
S577
RESPONSE MESSAGE
PROCESSING SIMILAR TO S529, NORMAL RESPONSE PROCESSING, AND ADD INFORMATION ON RESOURCE RESERVED WITH RESPECT TO RECEIVED FLOW IDENTIFIER AND SESSION IDENTIFIER FOR DOWNSTREAM TO FREE RESOURCE INFORMATION AND SET IT
S579
S581
RESPONSE MESSAGE
PROCESSING SIMILAR TO S533, NORMAL RESPONSE PROCESSING, AND ADD INFORMATION ON RESOURCE RESERVED WITH RESPECT TO RECEIVED FLOW IDENTIFIER AND SESSION IDENTIFIER FOR DOWNSTREAM TO FREE RESOURCE INFORMATION AND SET IT
S583
S585 RESPONSE MESSAGE
PROCESSING SIMILAR TO S533 AND NORMAL RESPONSE PROCESSING
S587
S589 RESPONSE MESSAGE
PROCESSING SIMILAR TO S541 AND SET DOWNSTREAM RESOURCE INFORMATION IN MESSAGE D
S591
S593 MESSAGE D

FIG. 19

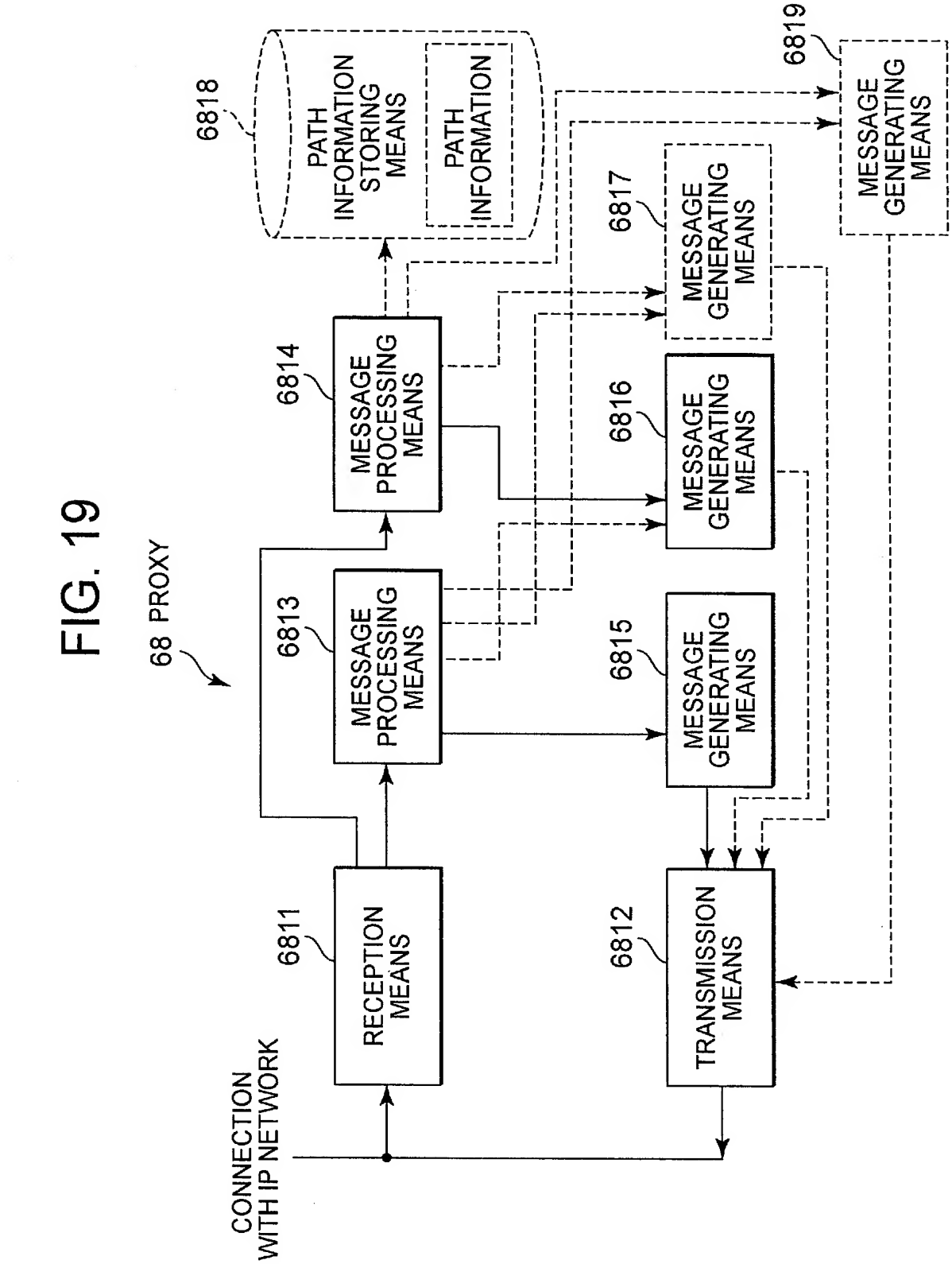

68 PROXY
CONNECTION WITH IP NETWORK
6811
RECEPTION MEANS
6812
TRANSMISSION MEANS
6813
MESSAGE PROCESSING MEANS
6814
MESSAGE PROCESSING MEANS
6815
MESSAGE GENERATING MEANS
6816
MESSAGE GENERATING MEANS
6817
MESSAGE GENERATING MEANS
6818
PATH INFORMATION STORING MEANS
PATH INFORMATION
6819
MESSAGE GENERATING MEANS

FIG. 20

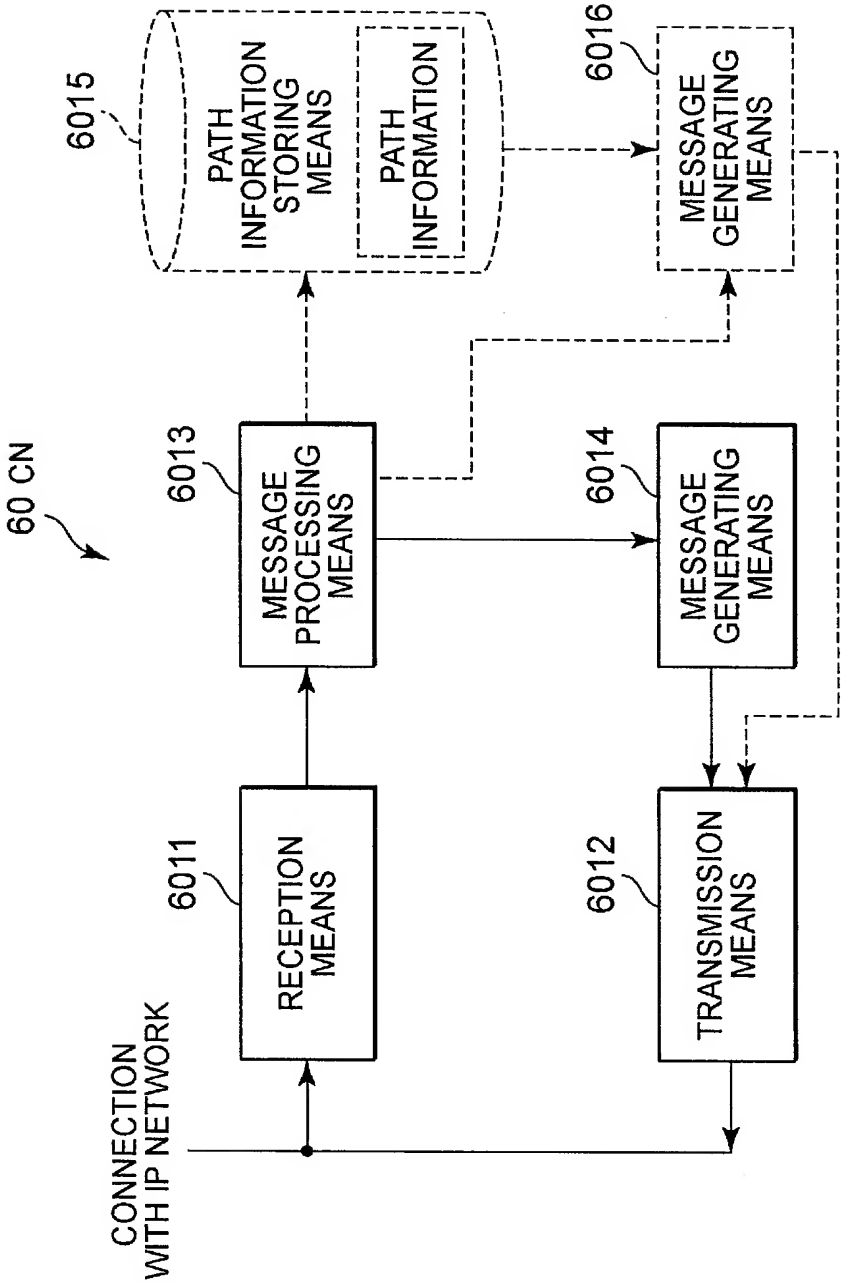

60 CN
6011
RECEPTION MEANS
6012
TRANSMISSION MEANS
6013
MESSAGE PROCESSING MEANS
6014
MESSAGE GENERATING MEANS
6015
PATH INFORMATION STORING MEANS
PATH INFORMATION
6016
MESSAGE GENERATING MEANS
CONNECTION WITH IP NETWORK

FIG. 21

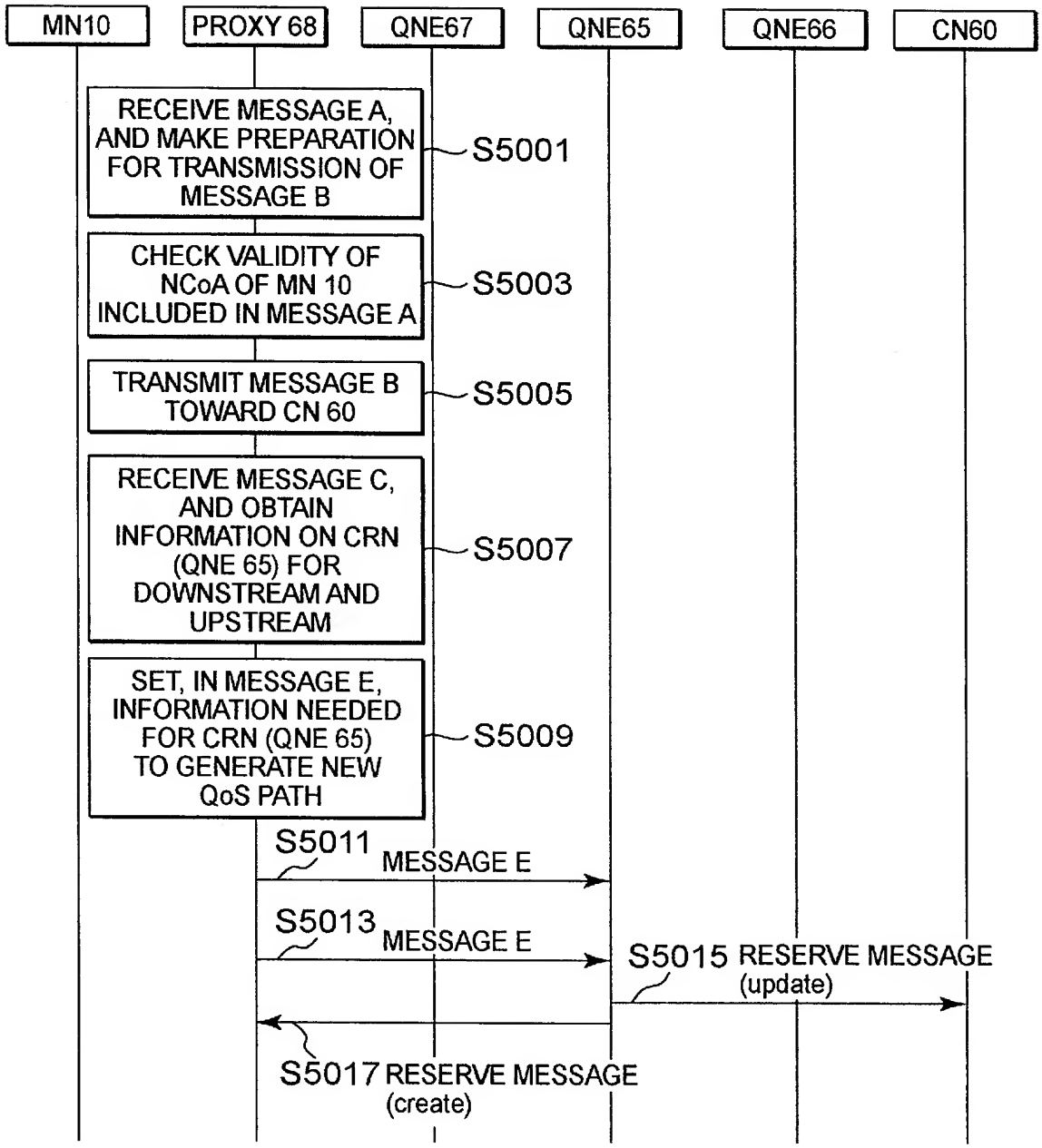

MN10
PROXY 68
QNE67
QNE65
QNE66
CN60
RECEIVE MESSAGE A, AND MAKE PREPARATION FOR TRANSMISSION OF MESSAGE B
S5001
CHECK VALIDITY OF NCoA OF MN 10 INCLUDED IN MESSAGE A
S5003
TRANSMIT MESSAGE B TOWARD CN 60
S5005
RECEIVE MESSAGE C, AND OBTAIN INFORMATION ON CRN (QNE 65) FOR DOWNSTREAM AND UPSTREAM
S5007
SET, IN MESSAGE E, INFORMATION NEEDED FOR CRN (QNE 65) TO GENERATE NEW QoS PATH
S5009
S5011
MESSAGE E
S5013
MESSAGE E
S5015 RESERVE MESSAGE
(update)
S5017 RESERVE MESSAGE
(create)

FIG. 22

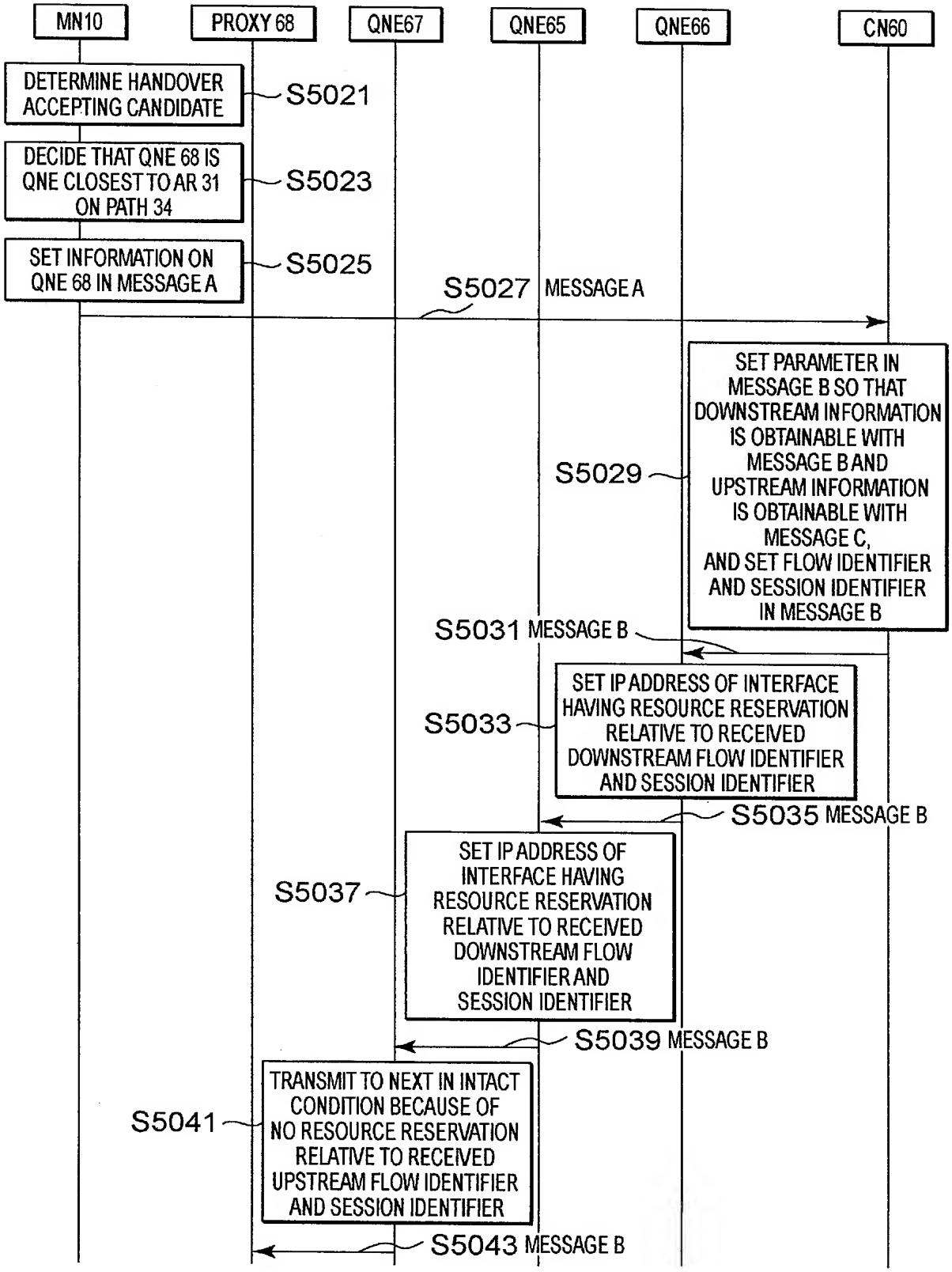

MN10
PROXY 68
QNE67
QNE65
QNE66
CN60
DETERMINE HANDOVER ACCEPTING CANDIDATE
S5021
DECIDE THAT QNE 68 IS QNE CLOSEST TO AR 31 ON PATH 34
S5023
SET INFORMATION ON QNE 68 IN MESSAGE A
S5025
S5027 MESSAGE A
SET PARAMETER IN MESSAGE B SO THAT DOWNSTREAM INFORMATION IS OBTAINABLE WITH MESSAGE B AND UPSTREAM INFORMATION IS OBTAINABLE WITH MESSAGE C, AND SET FLOW IDENTIFIER AND SESSION IDENTIFIER IN MESSAGE B
S5029
S5031 MESSAGE B
SET IP ADDRESS OF INTERFACE HAVING RESOURCE RESERVATION RELATIVE TO RECEIVED DOWNSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S5033
S5035 MESSAGE B
SET IP ADDRESS OF INTERFACE HAVING RESOURCE RESERVATION RELATIVE TO RECEIVED DOWNSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S5037
S5039 MESSAGE B
TRANSMIT TO NEXT IN INTACT CONDITION BECAUSE OF NO RESOURCE RESERVATION RELATIVE TO RECEIVED UPSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S5041
S5043 MESSAGE B

FIG. 23

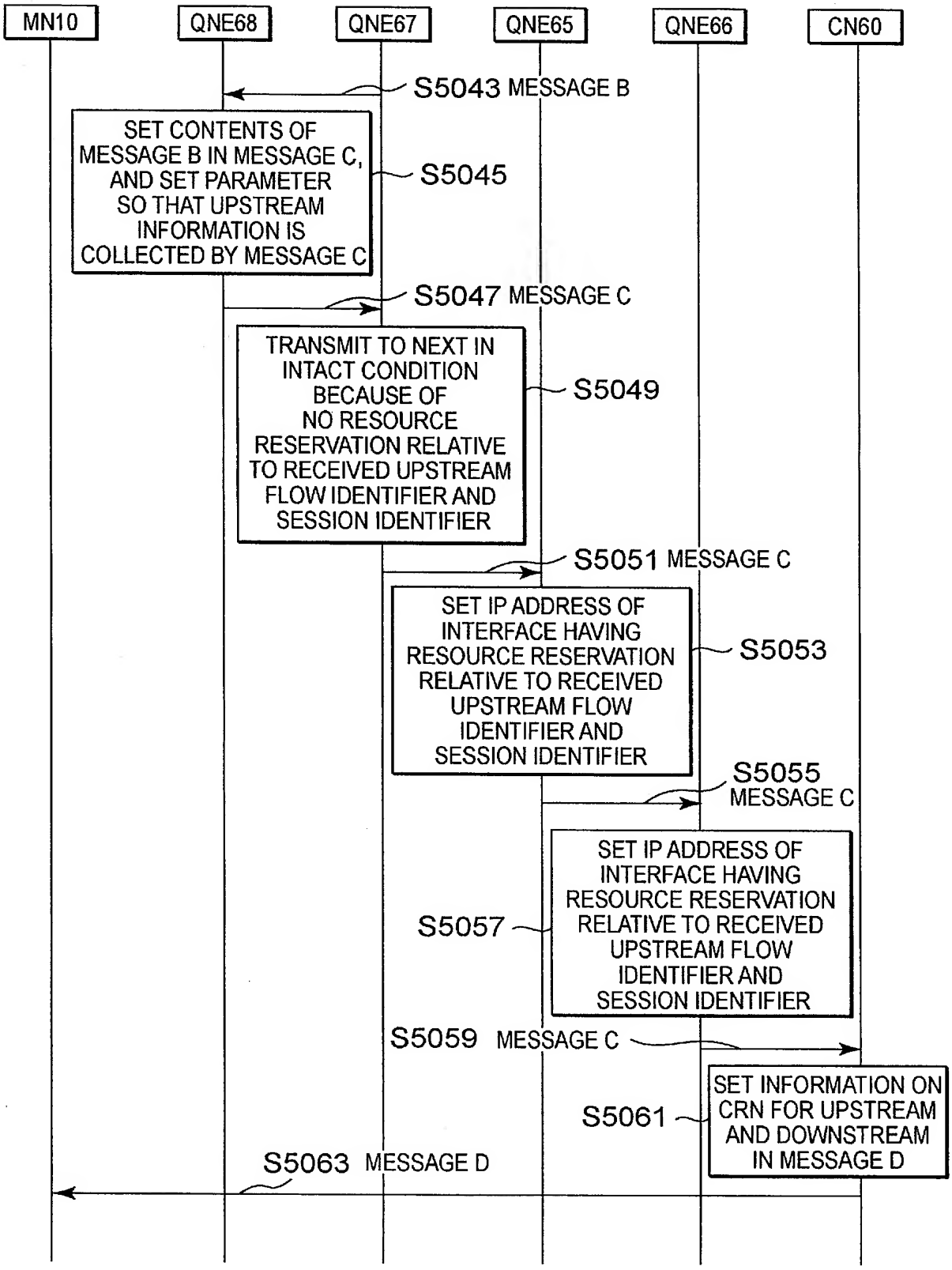

MN10
QNE68
QNE67
QNE65
QNE66
CN60
S5043 MESSAGE B
SET CONTENTS OF MESSAGE B IN MESSAGE C, AND SET PARAMETER SO THAT UPSTREAM INFORMATION IS COLLECTED BY MESSAGE C
S5045
S5047 MESSAGE C
TRANSMIT TO NEXT IN INTACT CONDITION BECAUSE OF NO RESOURCE RESERVATION RELATIVE TO RECEIVED UPSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S5049
S5051 MESSAGE C
SET IP ADDRESS OF INTERFACE HAVING RESOURCE RESERVATION RELATIVE TO RECEIVED UPSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S5053
S5055 MESSAGE C
SET IP ADDRESS OF INTERFACE HAVING RESOURCE RESERVATION RELATIVE TO RECEIVED UPSTREAM FLOW IDENTIFIER AND SESSION IDENTIFIER
S5057
S5059 MESSAGE C
SET INFORMATION ON CRN FOR UPSTREAM AND DOWNSTREAM IN MESSAGE D
S5061
S5063 MESSAGE D

FIG. 24

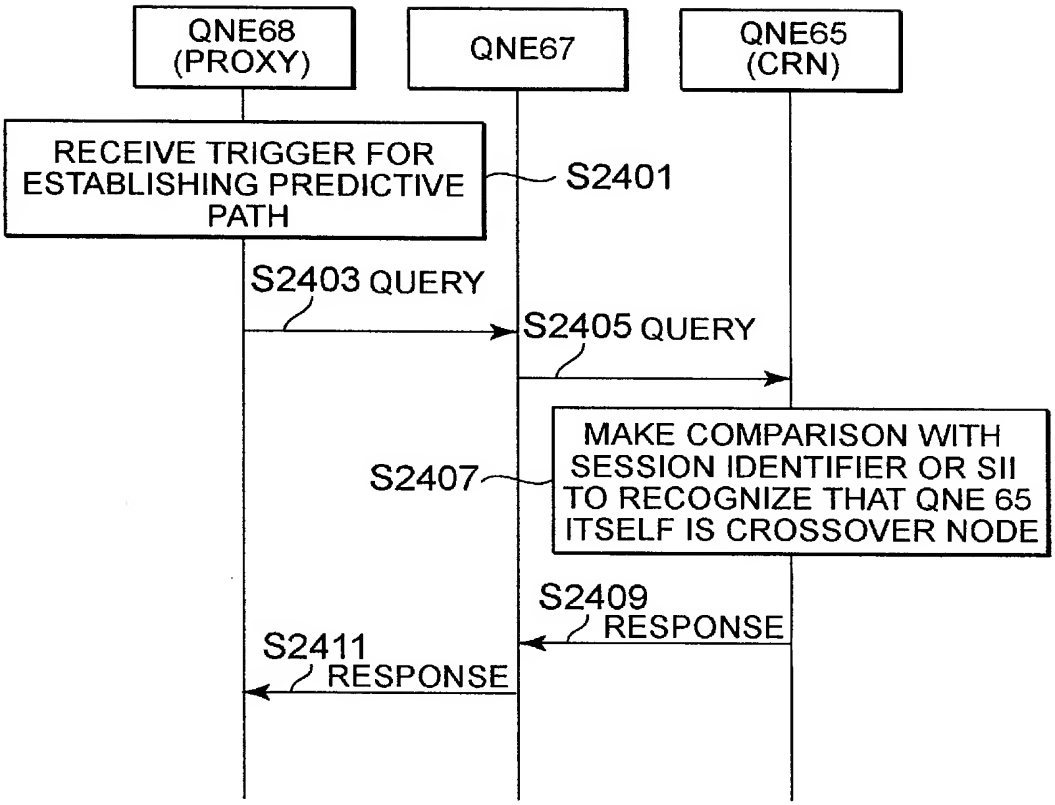
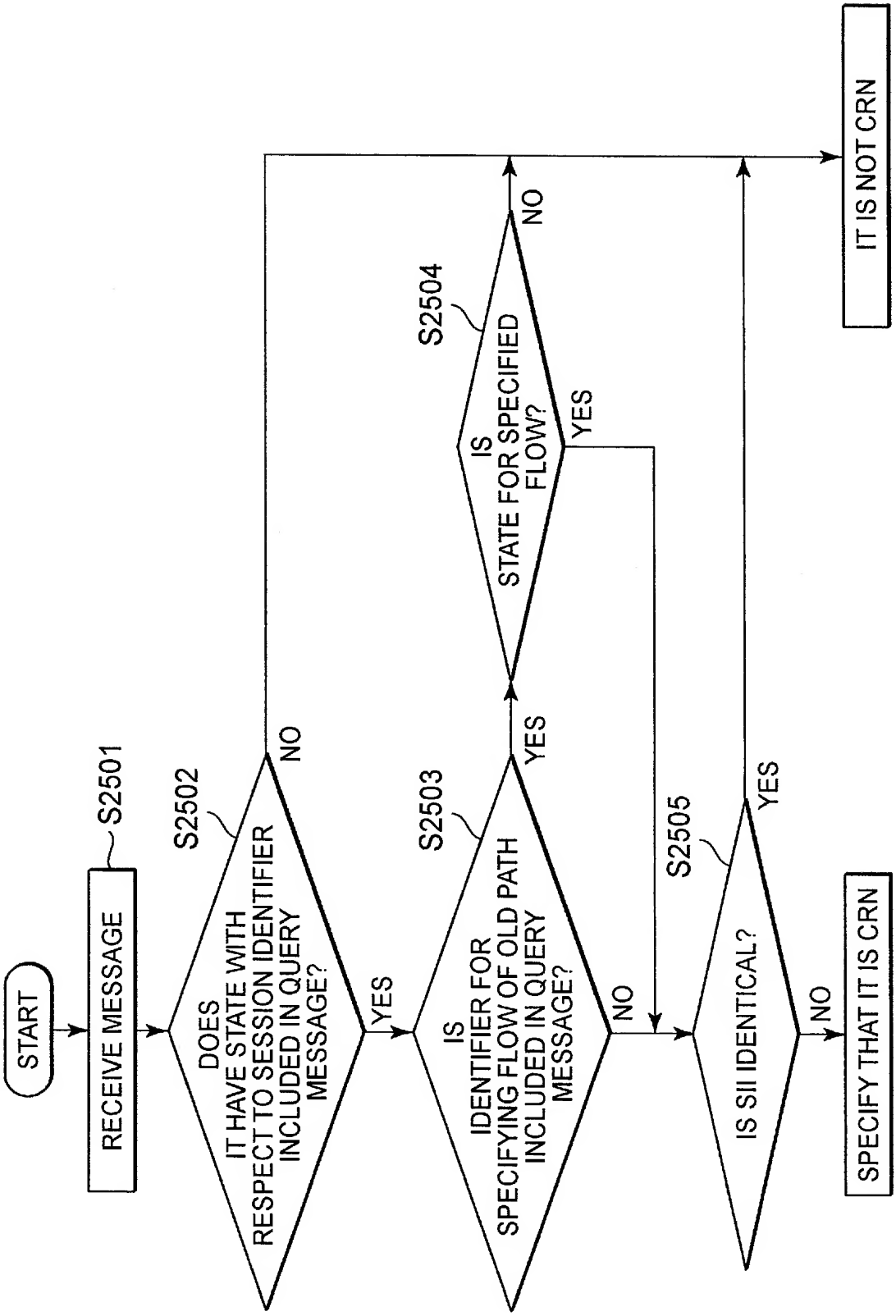

QNE68 (PROXY)
QNE67
QNE65 (CRN)
RECEIVE TRIGGER FOR ESTABLISHING PREDICTIVE PATH
S2401
S2403 QUERY
S2405 QUERY
MAKE COMPARISON WITH SESSION IDENTIFIER OR SII TO RECOGNIZE THAT QNE 65 ITSELF IS CROSSOVER NODE
S2407
S2409 RESPONSE
S2411 RESPONSE

FIG. 25


START
RECEIVE MESSAGE
S2501
DOES IT HAVE STATE WITH RESPECT TO SESSION IDENTIFIER INCLUDED IN QUERY MESSAGE?
S2502
NO
YES
IS IDENTIFIER FOR SPECIFYING FLOW OF OLD PATH INCLUDED IN QUERY MESSAGE?
S2503
YES
NO
IS STATE FOR SPECIFIED FLOW?
S2504
NO
YES
IS SII IDENTICAL?
S2505
YES
NO
IT IS NOT CRN
SPECIFY THAT IT IS CRN